

[Fig. 1]

100: Manuscript editing apparatus

200: Image processor

210: Editing apparatus communication means

5 220: Format conversion means

230: Rasterizing means

240: Color conversion means

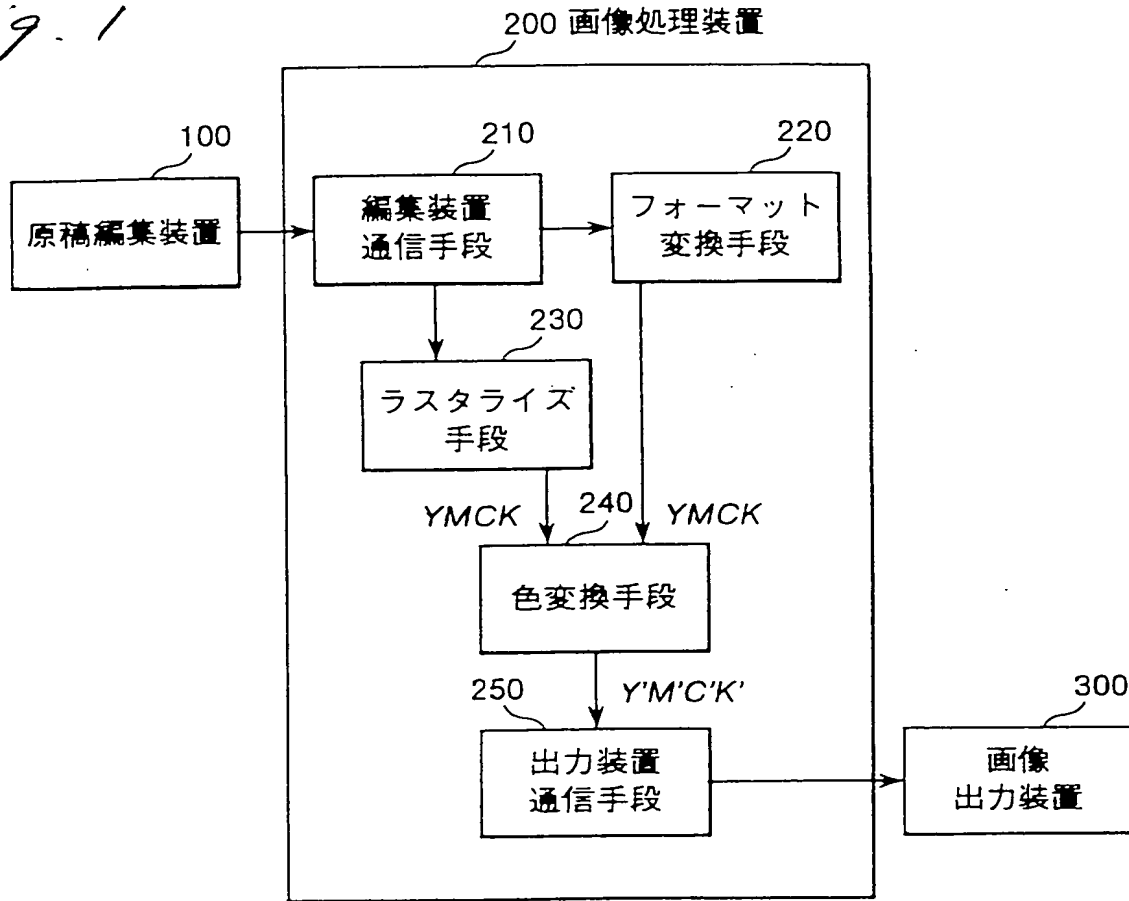
250: Output apparatus communication means

300: Image output apparatus

【書類名】 図面

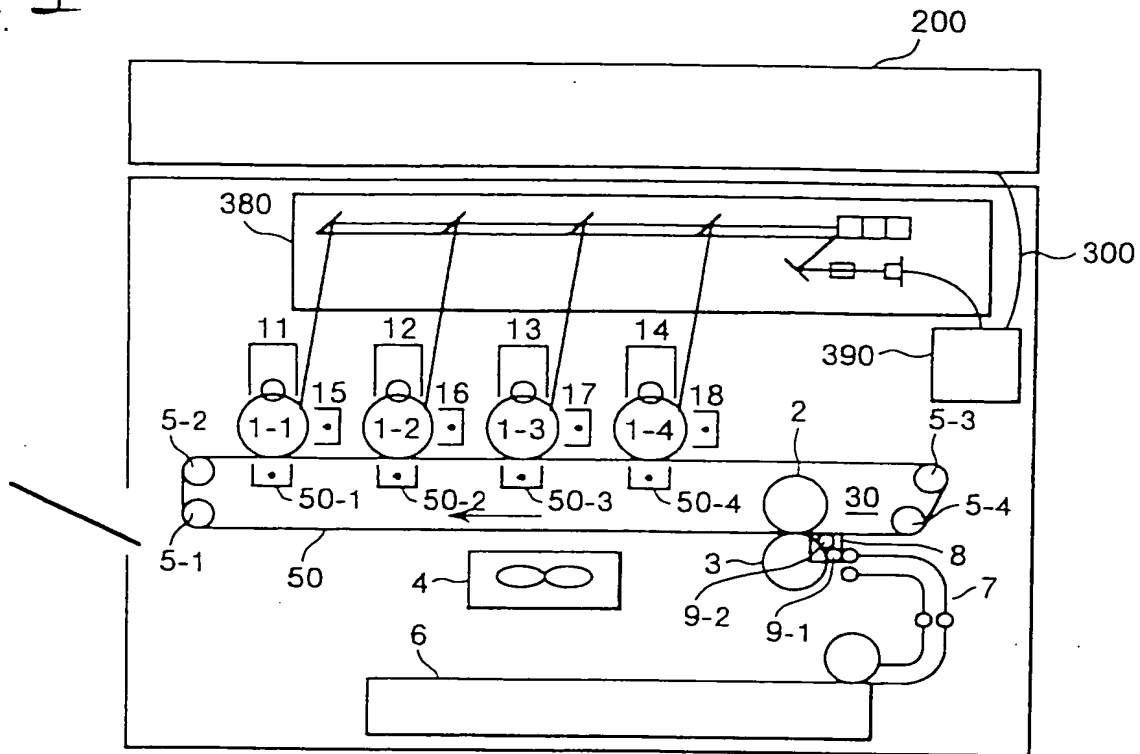
【図1】

Fig. 1



〔図2〕

Fig. 2



[Fig. 3]

220: Format conversion means

230: Rasterizing means

240: Color conversion means

5 241: Device-independent color space converter

242: Gradation compensator

243: YMC decision section

244: YMC judgment section

245: YMC correction section

10 246: YMCK output section

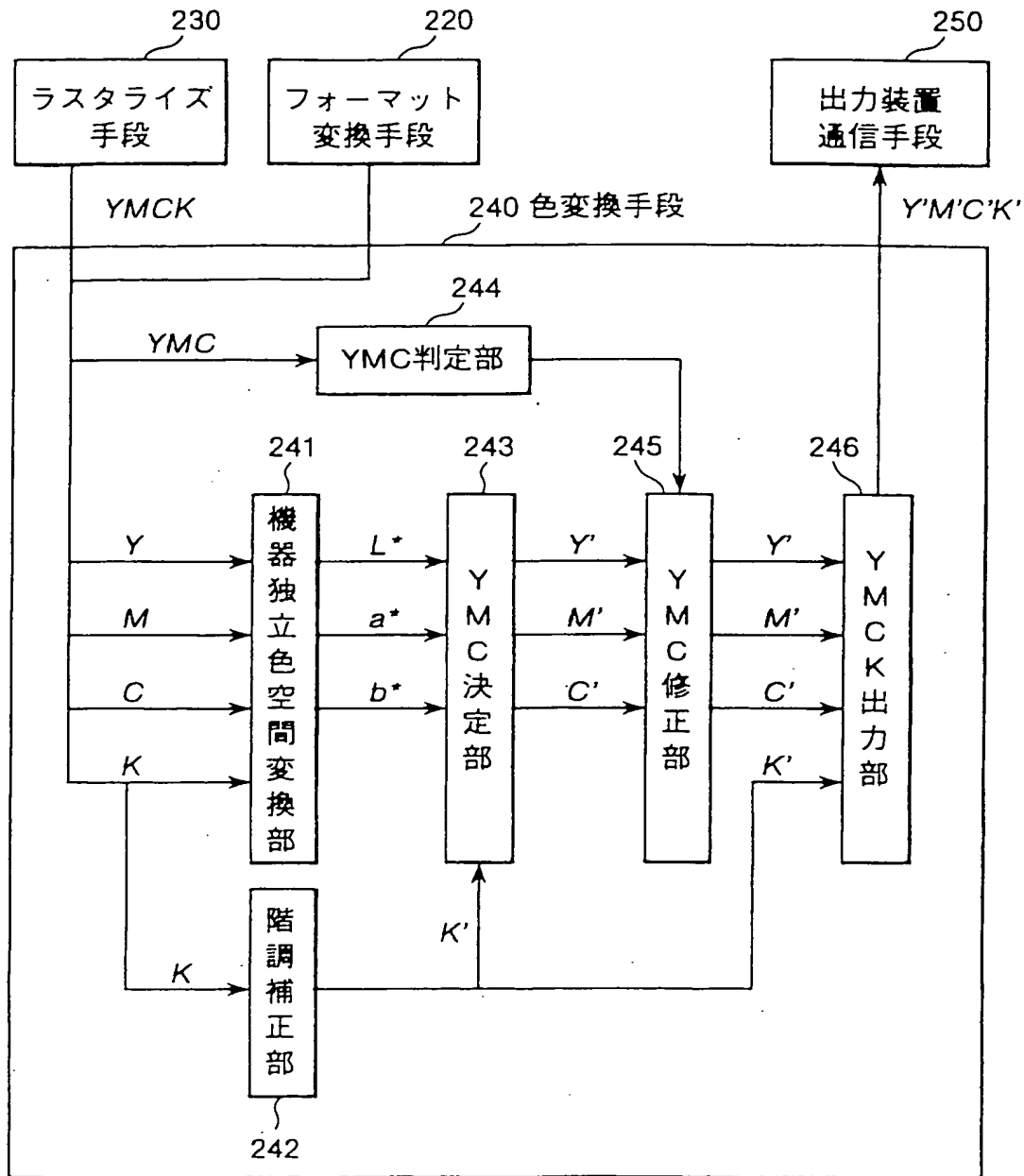
250: Output apparatus communication means

[Fig. 4]

15 Output black addition amount

Input black addition amount

図3 Fig 3

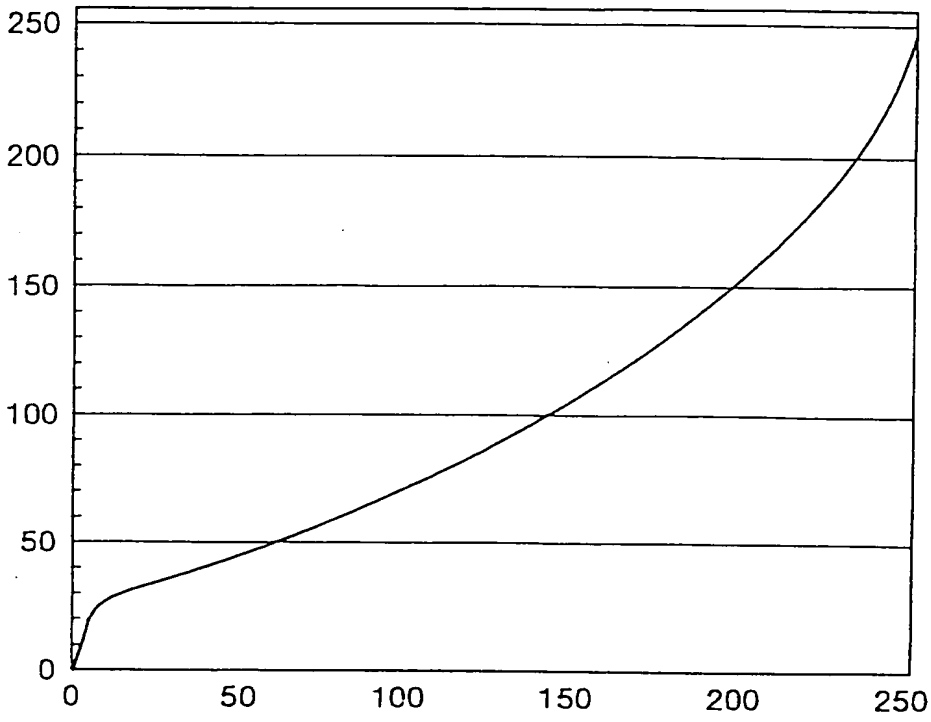


〔図4〕

Fig. 4

Output black addition amount

出力墨量



入力墨量

Input black addition amount

[Fig. 5]

#1 Comparison of color conversion accuracy between the present invention and related art

#2 Present invention

5 #3 Japanese Patent Laid-Open No. 87343/1995

#4 Japanese Patent Laid-Open No. 65534/1996

#5 Japanese Patent Laid-Open No. 116456/1996

#6 Japanese Patent Laid-Open No. 186894/1997

#7 Average color difference

10 #8 Maximum color difference

#9 Comparison of reproduction in a single black color between the present invention and related art

#10 Color conversion system

#11 Reproduction in a single black color

15 #12 Legend:

○: Reproduction in a single black color possible

×: Reproduction in a single black color impossible

20 [Fig. 6]

220: Format conversion means

230: Rasterizing means

240: Color conversion means

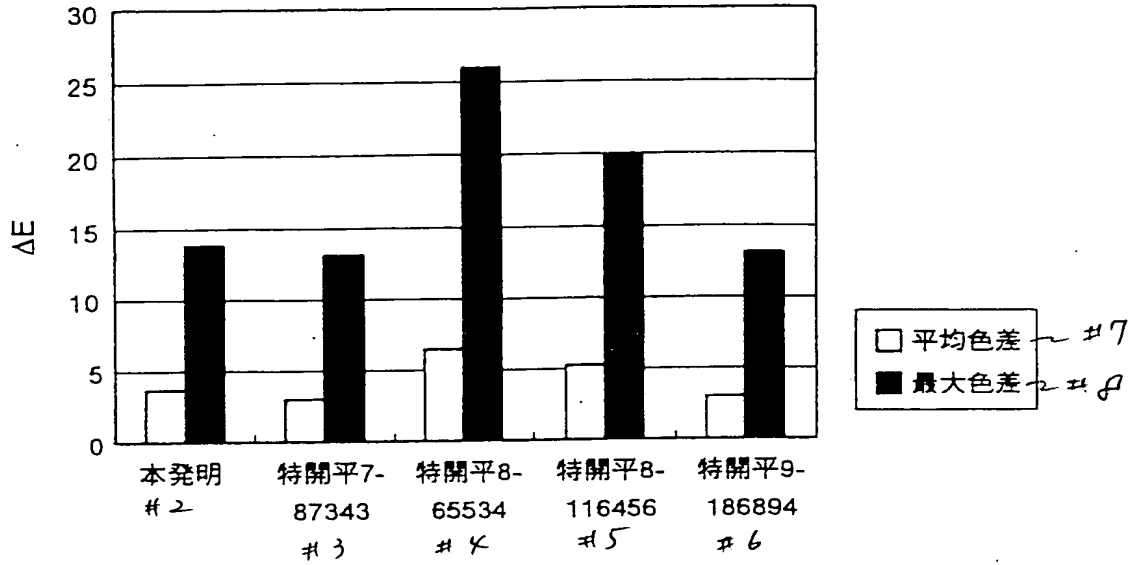
247: Four-dimensional DLUT color converter

25 250: Output apparatus communication means

【図 5】

Fig. 5

本発明と従来技術の色変換精度比較



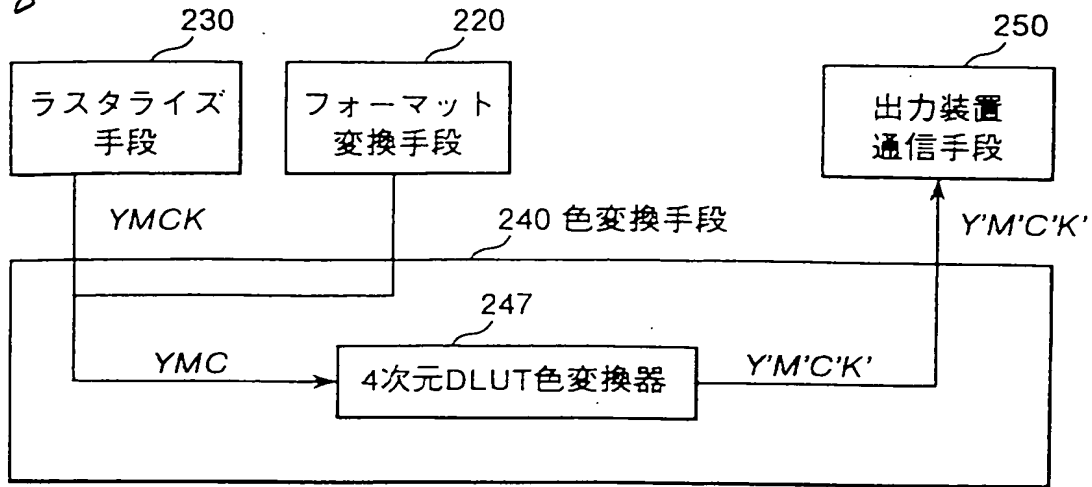
本発明と従来技術の墨1色再現比較

色変換方式	本発明	特開平 7-87343	特開平 8-65534	特開平 8-116456	特開平 9-186894
墨1色再現	○	×	○	○	×

判例
○ 墨1色再現可能
× 墨1色再現不可能

【図6】

Fig. 6



[Fig. 7]

Step 1

A color patch is printed out corresponding to an arbitrary combination of printing color signals Y, M, C and K and the colorimetric values color signals Y, M, C and K are measured.

Step 2

Neural Network 1 is instructed to study a data set of Y, M, C and K and $L^*a^*b^*$ as instructor data.

Step 3

A color patch corresponding to an arbitrary combination of image recording signals Y', M', C' and K' for the image output apparatus 300 is printed out and the colorimetric values $L^*a^*b^*$ are measured.

Step 4

Neural Network 2 is instructed to study a data set of Y', M', C' and K' and $L^*a^*b^*$ as instructor data.

Step 5

Colorimetric values $L^*a^*b^*$ for the input address values Y, M, C and K of the four-dimensional DLUT color converter are determined by using Neural Network 1.

Step 6

Black addition amount K' for the image output apparatus that has an equivalent lightness to that of the input address value K of the four-dimensional DLUT color converter is determined
5 by using the one-dimensional lookup table.

Step 7

By solving Neural Network 2 by using the numerical solution from the colorimetric values $L^*a^*b^*$ and the black addition
10 amount K' , colorimetrically consistent values Y' , M' and C' are calculated.

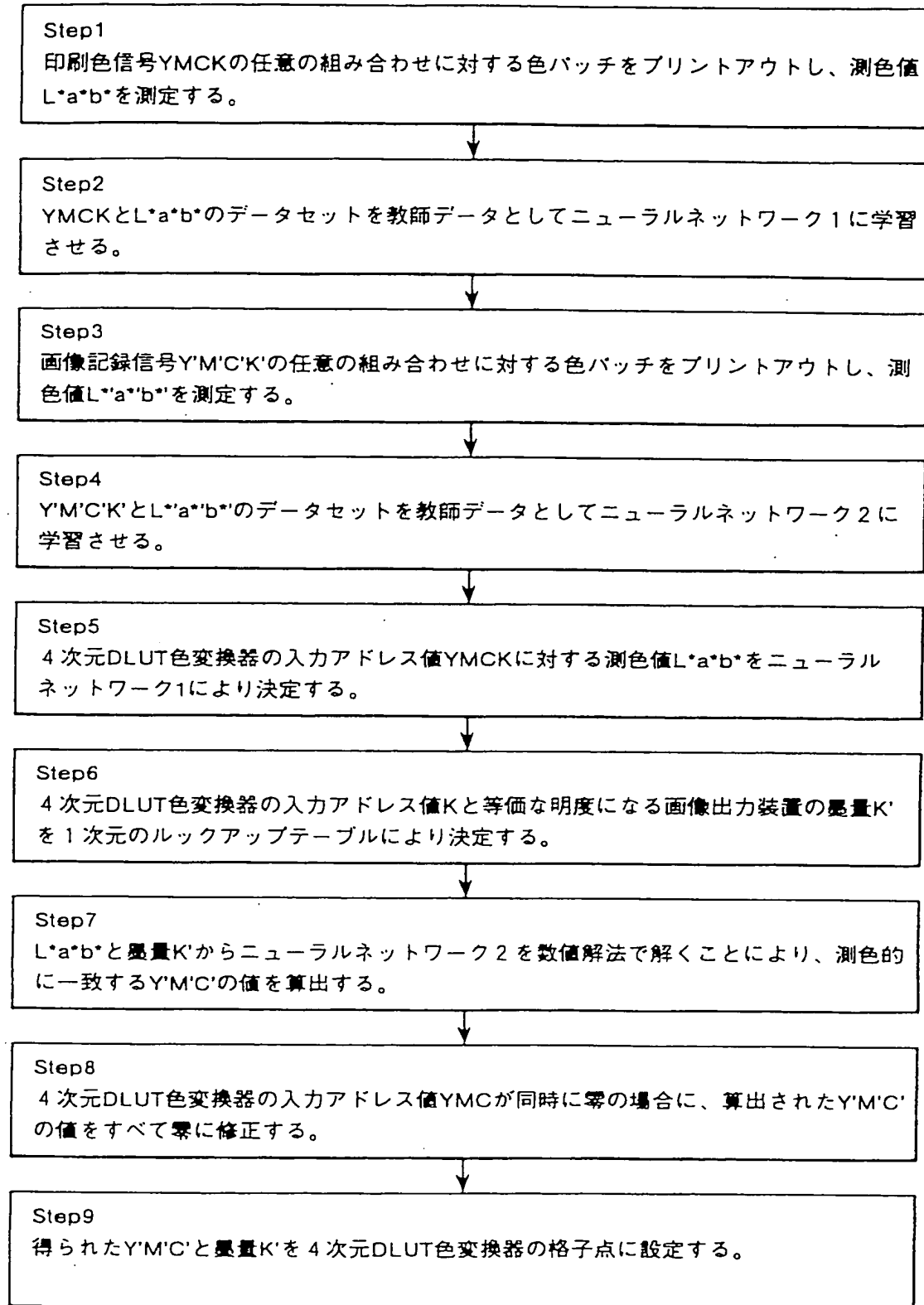
Step 8

When the input address values Y , M and C of the four-dimensional
15 DLUT color converter are all zero, calculated values Y' , M' and C' are all corrected to be zero.

Step 9

Obtained Y' , M' and C' and black addition amount K' are set
20 to lattice points of the four-dimensional DLUT color converter.

【図 7】 Fig. 17



[Fig. 8]

220: Format conversion means

230: Rasterizing means

240: Color conversion means

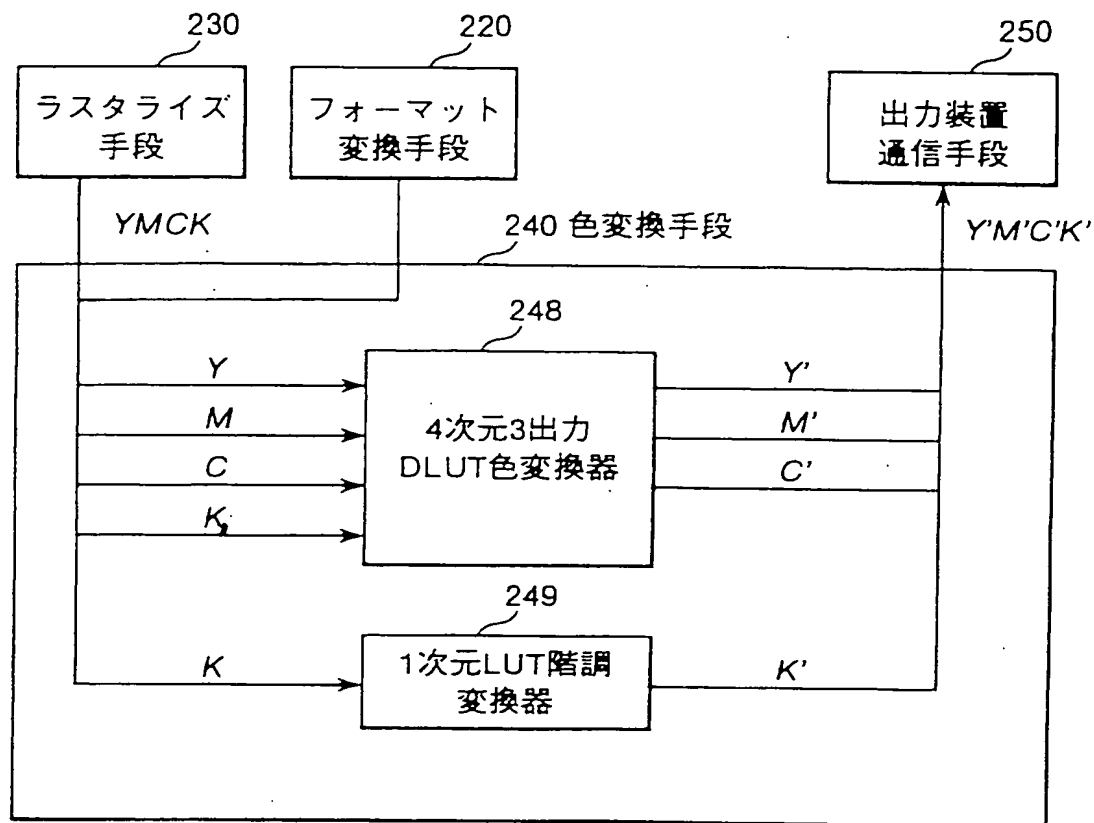
5 248: Four-dimensional 3-output DLUT color converter

249: One-dimensional LUT gradation converter

250: Output apparatus communication means

1. The first part of the report, which is the most important, is the introduction. This part should be written in a clear and concise manner, and should provide a brief overview of the project and its objectives.

【図8】 Fig. 8



[Fig. 9]

Step 1'

A color patch is printed out corresponding to an arbitrary combination of printing color signals Y, M, C and K and the colorimetric values color signals Y, M, C and K are measured.

Step 2'

Neural Network 1 is instructed to study a data set of Y, M, C and K and $L^*a^*b^*$ as instructor data.

Step 3'

A color patch corresponding to an arbitrary combination of image recording signals Y', M', C' and K' for the image output apparatus 300 is printed out and the colorimetric values $L^*a^*b^*$ are measured.

Step 4'

Neural Network 2 is instructed to study a data set of Y', M', C' and K' and $L^*a^*b^*$ as instructor data.

Step 5'

Colorimetric values $L^*a^*b^*$ for the input address values Y, M, C and K of the 4-input 3-output DLUT color converter are determined by using Neural Network 1.

Step 6'

Black addition amount K' for the image output apparatus that has an equivalent lightness to that of the input address value K of the four-dimensional DLUT color converter is determined
5 by using the one-dimensional lookup table.

Step 7'

By solving Neural Network 2 by using the numerical solution from the colorimetric values $L^*a^*b^*$ and the black addition
10 amount K' , colorimetrically consistent values Y' , M' and C' are calculated.

Step 8'

When the input address values Y , M and C of the 4-input 3-
15 output DLUT color converter are all zero, calculated values Y' , M' and C' are all corrected to be zero.

Step 9'

Obtained Y' , M' and C' and black addition amount K' are set
20 to lattice points of the four-dimensional DLUT color converter.

+図9+ F9.9

Step1'

印刷色信号YMCKの任意の組み合わせに対する色パッチをプリントアウトし、測色値 $L^*a^*b^*$ を測定する。

Step2'

YMCKと $L^*a^*b^*$ のデータセットを教師データとしてニューラルネットワーク1に学習させる。

Step3'

画像記録信号Y'M'C'K'の任意の組み合わせに対する色パッチをプリントアウトし、測色値 $L^*a^*b^*$ を測定する。

Step4'

Y'M'C'K'と $L^*a^*b^*$ のデータセットを教師データとしてニューラルネットワーク2に学習させる。

Step5'

4入力3出力DLUT色変換器の入力アドレス値YMCKに対する測色値 $L^*a^*b^*$ をニューラルネットワーク1により決定する。

Step6'

4入力3出力DLUT色変換器の入力アドレス値Kと等価な明度になる画像出力装置の墨量K'を1次元のルックアップテーブルにより決定する。

Step7'

$L^*a^*b^*$ と墨量K'からニューラルネットワーク2を数値解法で解くことにより、測色的に一致するY'M'C'の値を算出する。

Step8'

4入力3出力DLUT色変換器の入力アドレス値YMCが同時に零の場合に、算出されたY'M'C'の値をすべて零に修正する。

Step9'

得られたY'M'C'と墨量K'を4入力3出力DLUT色変換器の格子点に設定する。